

REMARKS

Claims 1-4, 6, and 7 have been amended. Claims 1-11, 21, and 22 are pending in the application. Applicants reserve the right to pursue the original claims and other claims in this and other applications.

Claims 1-9 and 21 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1-4, 6, and 7 have been amended as shown above to address the concerns raised in the Office Action. Specifically, the terms “low temperature,” “high temperature,” “lowly” doped, and “highly” doped have been removed. Applicants respectfully request that the rejection be withdrawn and the claims allowed.

Claims 1 and 3 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,786,605 (“Gwin”). This rejection is respectfully traversed.

Claim 1 recites that “said first temperature is about 300°C and said second temperature is about 800°C.” Gwin does not disclose this feature. To the contrary, Gwin discloses that the temperatures used in its semiconductor processing method are approximately 850°C, 945°C, and 980°C. (Gwin, column 2, line 63 to column 3, line 16). The temperatures recited by Gwin do not anticipate the claimed temperatures.

Since Gwin does not disclose all of the limitations of claim 1, claim 1 is not anticipated by Gwin. Claim 3 contains limitations similar to those of claim 1 and is allowable at least for reasons similar to those discussed above with regard to claim 1. Applicant respectfully requests that the rejection be withdrawn and the claims allowed.

Claims 3 and 4 stand rejected under 35 U.S.C. § 102(b) as being anticipated by PCT Publication No. WO 02/089223 (“Ishizaki”) as allegedly translated by U.S. Patent No. 6,939,731. This rejection is respectfully traversed.

Applicants respectfully submit that the final rejection over Ishizaki is improper because the Examiner has not provided an English translation of Ishizaki. According to the MPEP, “[i]f the document is in a language other than English and the examiner seeks to rely on that document, a translation must be obtained so that the record is clear as to the precise facts the examiner is relying upon in support of the rejection.” *MPEP* 706.02(II). The related U.S. Patent cannot be relied upon as a literal translation, because it is not clear whether the related U.S. Patent is a literal translation of Ishizaki. Therefore, Applicants respectfully request that the rejection be withdrawn and an English translation of Ishizaki be provided.

Furthermore, claim 3 recites “a total duration of the doped layer growing step is at least 100 seconds.” Even assuming *arguendo* that the related U.S. patent is a proper translation of Ishizaki, Ishizaki does not disclose this feature. To the contrary, Ishizaki only discusses “an interruption time for the introduction of the organometallic compound as long as 1 second or more so as to tolerate the mechanical accuracy” and “a retention period for one cycle of 5 to 15 seconds.” (Ishizaki, column 19, line 62 to column 20, line 3).

Since Ishizaki does not disclose all of the limitations of claim 3, claim 3 is not anticipated by Ishizaki. Claim 4 depends from claim 3 and is patentable at least for the reasons mentioned above. Applicant respectfully requests that the rejection be withdrawn and the claims allowed.

Claim 5/1 and 5/3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Gwin in view of and U.S. Patent No. 6,617,539 (“Koinuma”). This rejection is respectfully traversed. Claims 5/1 and 5/3 depend from claims 1 and 3, respectively, and are patentable over Gwin for at least the reasons mentioned above. Koinuma, which has been cited as teaching the use of a laser, does not cure the deficiencies of Gwin discussed above. Accordingly, Applicants respectfully request that the rejection be withdrawn and the claims allowed.

Claims 1, 2, 6, 7, and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishizaki as evidenced by the article by Tsukazaki et al. *Repeated temperature modulation epitaxy*

for *p*-type doping and light-emitting diode based on ZnO, Nature Materials, Vol. 4, January 2005, "Tsukazaki". This rejection is respectfully traversed.

Claim 1 recites that "a total duration of the first doped layer growing step and the second doped layer growing step is at least 100 seconds." Ishizaki does not teach or suggest this limitation, or otherwise render claim 1 obvious. To the contrary, Ishizaki only discusses "an interruption time for the introduction of the organometallic compound as long as 1 second or more so as to tolerate the mechanical accuracy" and "a retention period for one cycle of 5 to 15 seconds." (Ishizaki, column 19, line 62 to column 20, line 3).

Tsukazaki is cited to show that the concentration of nitrogen dopants in a film grown at higher temperatures will be lower than that of a film grown at lower temperatures. (Office Action, page 8). Even assuming, *arguendo*, that this principle is true, Tsukazaki does not cure the deficiencies of Ishizaki discussed above. It should also be noted that Tsukazaki was published on December 19, 2004, which is after the PCT filing date of the present application, September 10, 2004, and therefore may not be cited as prior art. Further, if the Tsukazaki article were to be combined with Ishizaki, the Tsukazaki article, which only relates to "the second doped layer growing step" in amended claims 1, 3 and 6, would not cure the deficiencies of Ishizaki.

Further, the main object of Ishizaki is to repair an oxygen deficiency generated in a MgZnO-base oxide in a light emitting device having a MgZnO-base oxide layer. Ishizaki states that "oxygen during the annealing period is necessary only in an amount consumed for suppressing or repairing the oxygen deficiency." (Ishizaki, column 20, lines 11-13). Therefore, one second or so is enough for "an interruption time for the introduction of the organometallic compound" of Ishizaki and thus "a retention period for one cycle" consisting of a supply of organometallic gas and an interruption of the supply is "5 to 15 seconds." In view of these facts, it would not be obvious to modify the method of Ishizaki such that "the total duration of the first doped layer growing step and the second doped layer growing step is at least 100 seconds", as recited in claims 1, 3 and 6. Such a modification would completely digress from the teachings of Ishizaki.

Moreover, as described above, the main object of Ishizaki is to repair an oxygen deficiency generated in a MgZnO-base oxide in a light emitting device having a MgZnO-base oxide layer, and therefore, Ishizaki carries out only the minimum required annealing for a very short period to supply the minimum amount of oxygen for suppressing or repairing the oxygen deficiency. In contrast, the object of Tsukazaki is “to satisfy both high crystallinity and high nitrogen concentration (C_N),” (Tsukazaki, page 43, lines 3-4 from the bottom of the left column), which is not relevant to the main object of Ishizaki. Therefore, there is no motivation to combine Ishizaki with Tsukazaki.

Since Ishizaki does not teach or suggest all of the limitations of claim 1, claim 1 is not obvious over the cited reference. Claim 6 contains limitations similar to those of claim 1 and is allowable at least for reasons similar to those discussed above with regard to claim 1. Claims 2, 7, and 8 depend from claims 1 or 6 and are patentable at least for the reasons mentioned above. Applicants respectfully request that the rejection be withdrawn and the claims allowed.

Claim 5, 9, and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishizaki in view of and U.S. Patent No. 6,617,539 (“Koinuma”). This rejection is respectfully traversed. Claims 5, 9, and 21 depend from claims 3 and 6, respectively, and are patentable over Ishizaki for at least the reasons mentioned above. Koinuma, which has been cited as teaching the use of a laser, does not cure the deficiencies of Ishizaki discussed above. Accordingly, Applicants respectfully request that the rejection be withdrawn and the claims allowed.

In view of the above, Applicants believe the pending application is in condition for allowance.

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Respectfully submitted,

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